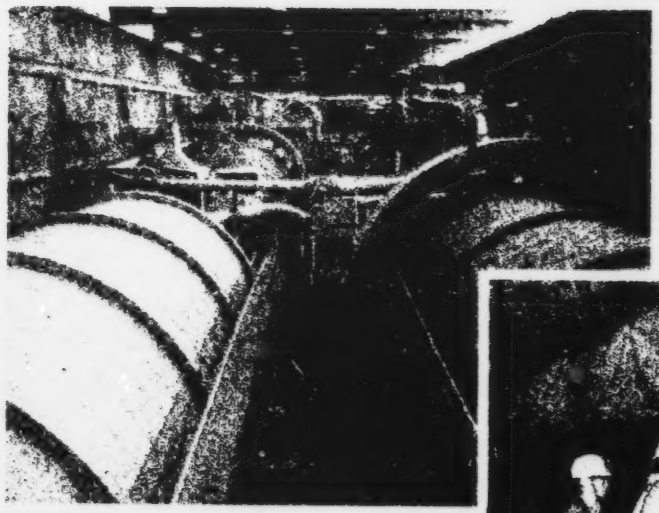
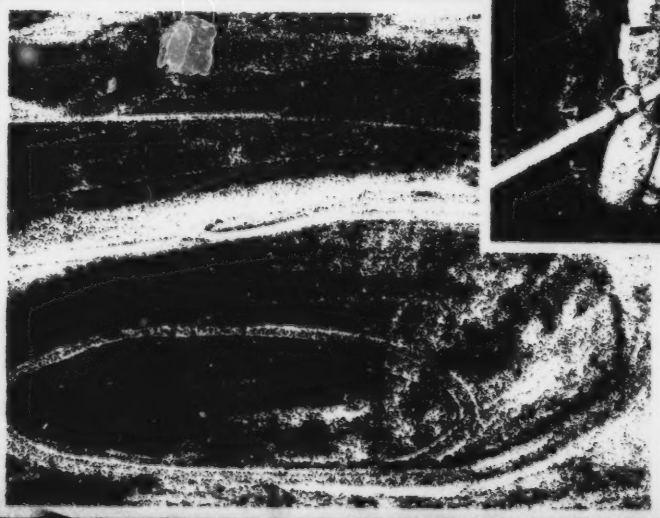
BC

Province of British Columbia

MANPOWER STUDY OF THE MINING INDUSTRY





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MANPOWER STUDY OF THE MINING INDUSTRY

REPORT II

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ACKNOWLEDGEMENT

This report is the second of two publications presenting the findings of a pilot manpower information project initiated by the British Columbia Government in conjunction with the Mining Association of British Columbia and the Federal Government. The principal objective of this cooperative project was to obtain information pertinent to the development of a manpower policy in both the private and public sectors and to ensure that public monies are allocated to post-secondary education and training in an effective manner. The mining industry was chosen as the pilot because of its importance to the provincial economy.

Without the support and guidance of the Mining Association of British Columbia it would have been impossible for this project to be carried out. Particular credit for the success of the project must go to the members of the mining industry, both employers and employees, who gave time and effort to complete the survey questionnaires. Special thanks also go to the Federal Government for its participation in the project, particularly to Statistics Canada and the Canada Employment and Immigration Commission.

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I. INTRODUCTION

This is the second volume of a two-part study of work force characteristics in the British Columbia mining industry. The overall objective of the study was to provide accurate and detailed information which could be used by manpower planners and trainers in both the public and private sectors. While some information is regularly collected through other sources, such as the Labour Force Survey (Statistics Canada) and the Census (Statistics Canada) these surveys provide only a partial picture of the manpower planning and training process. To provide a more complete picture a two-part survey was launched in the Spring of 1982. Employers were surveyed in Part I, followed by employees in Part II.[1]

The manpower study of the Mining Industry Report I covered all six sub-industries of the Province's mining industry: metal mines, coal mines, non-metal mines, sand pits/quarries, mining services and smelting and refining.[2] It examined a number of subject areas including total employment in the industry, occupational distributions, age structure of the mining workforce and apprenticeship training ratios.

The results of the employer survey were published in November 1983, and are available from the Ministry of Labour. The highlights of this report are summarized in this volume. (See Appendix A, page 39).

Report II examines work force demography, migration, education, skill substitution, and duration of employment in the mining industry. This Report segregates the mining work force into three discrete groups - professionals, technicians, and tradesmen - and each are analysed separately. Some tables include data on management occupations. Employees in management were surveyed primarily to answer questions on movement from selected technical, professional and trade occupations into management. Thus, tabulations on foremen and administrators are

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1 For more details regarding data collection, please see Report I, Appendices 5, 6 and 7, pages 107 - 113.

2 Data on the smelting and refining sub-industry are not included in Report II. Due to the structure of this sector, respondent anonymity could not be ensured.

included only when the data are relevant to the attrition of professionals, technicians and tradesmen. Table I below gives a comparative summary of the survey populations in Reports I and II.

TABLE I
SUMMARY OF SURVEY POPULATION

Occupation Group	Number of Employees in the Mining Industry Covered in Report I	Number of Employees in the Smelting and Refining Sub-Industry	Number of Employees in the Mining Industry Covered in Report II
Management/Administration[1] (Includes Foremen)	2785	504	2281
Professional/Technical	2418	857	1561
Professional	1312	413	899
Technical	1106	444	662
Tradesmen[2]	4555	1234	3321
Journeymen	4228	1234	2994
Journeymen Assistants	327	0	327
Total Survey Population	9758	2595	7163

[1] In the non-foremen management/administration group, tabulations throughout the Report include only those managers/administrators who responded and thus does not necessarily represent the characteristics of the group as a whole.

[2] Apprentices were not surveyed.

II SUMMARY OF FINDINGS

1. Demographic Characteristics

a) Age

Age distributions were presented in Report I. However, the data collected from employers provided information on two age groups only, "Under 55" and "55 and Over". The age information collected from the employee questionnaires provides more detailed distributions as illustrated in Table 2. Technicians are the youngest group with an average age of 31.5 years. This may be explained by the relatively recent development of some of the technical occupations. Management/Administration is the oldest group at an average age of 43.8 years.

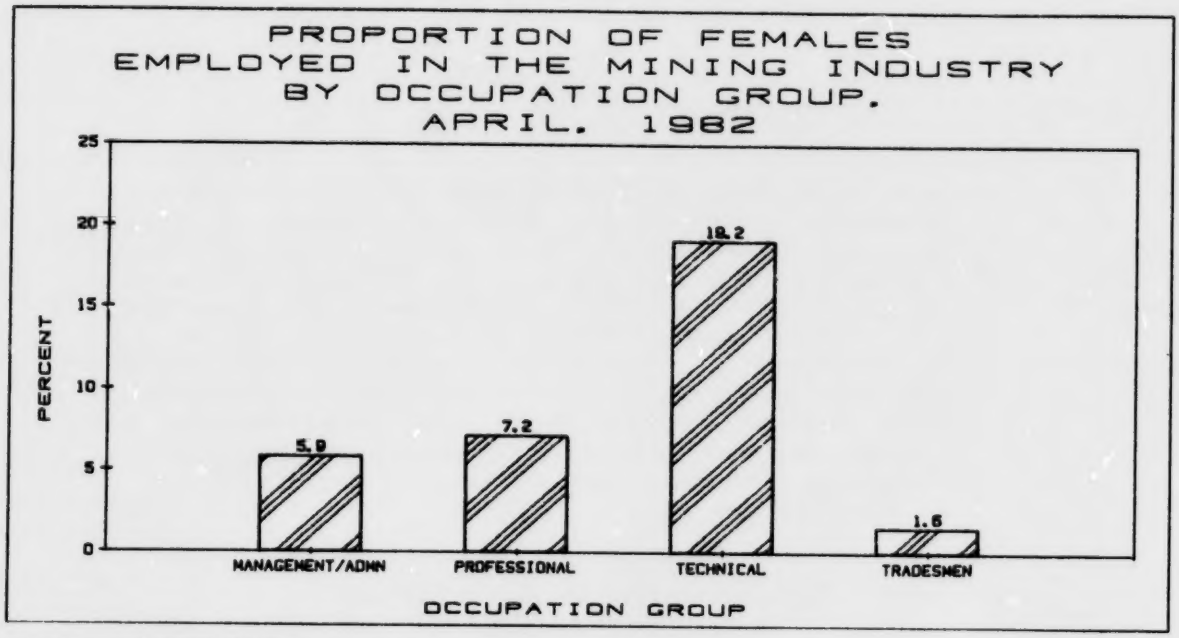
TABLE 2
COMPARATIVE AGE SUMMARY BY OCCUPATION GROUP
Mining Industry, 1982

Occupation	Total	AGE (%)						Average Age
		Under 25	25-34	35-44	45-54	55-59	60+	
Professional	899	5.2	49.2	30.4	10.5	1.8	2.8	35.5
Technical	662	21.1	51.1	19.3	5.4	1.5	1.5	31.5
Tradesmen	3321	6.3	42.6	29.7	13.1	4.4	4.0	37.0
Management/Admin.	579	-	19.2	38.7	26.8	8.8	6.4	43.8
Foremen Trades	423	-	24.8	50.3	18.4	3.5	2.9	40.0
Foremen-Labour	512	-	21.5	50.0	18.5	4.3	5.7	41.0

b) Sex

Few women are employed in the mining industry. The highest numbers are found in the technical group, where a substantial number of women are employed as assayers. In the journeymen category women represent only 0.5 percent of the workforce. Because many women are employed as journeymen assistants, the overall proportion of women in the trades is 1.6 percent. No foremen who responded to the questionnaire were female.

Figure 1



2. Migration

Tabulations of new migrants in the British Columbia mining industry shed some light on recruitment patterns. Tradesmen stand out as having a relatively large proportion who come from Alberta. Professionals are also noteworthy having the lowest rate of recruitment from within British Columbia - 58.3 percent. Almost 25 percent come from eastern Canada. Labour foremen, on the other hand, show a relatively large rate of recruitment from within the province, undoubtedly a reflection of promotion practices within mining establishments.

TABLE 3
PLACE OF RESIDENCE IMMEDIATELY PRIOR TO JOB WITH CURRENT EMPLOYER
BY OCCUPATION GROUP
Mining Industry, 1982

Occupation Group	All	B.C.	Alberta	Other Prairie	Ontario	Rest of Canada	USA	UK	Europe	Rest of World
Professionals	899	58.3	6.3	5.5	12.7	11.7	1.9	1.0	0.4	2.2
Technicians	662	68.7	8.8	5.4	7.4	6.8	-	0.5	0.2	2.3
Tradesmen[1]	3321	63.1	10.2	5.0	8.7	8.3	0.2	1.5	1.0	2.0
Management/Admin	579	71.0	8.3	3.1	5.9	4.9	2.3	1.3	-	3.2
Foremen-Trades	423	72.7	4.3	5.3	6.4	9.2	-	1.3	-	0.8
Foremen-Labour	512	80.8	5.5	5.5	2.9	5.3	-	-	-	-

[1] Tradesmen include both journeymen and assistants. Apprentices are not included.

3. Education

Technicians, as a group, have the least formal training with 23.1 percent having no education beyond high school. Professionals, not surprisingly, are well educated; all but 2.7 percent have post secondary education. Tradesmen fall in between with 16.6 percent having no post secondary education.

4. Occupational/Skill Mobility or Substitution

Employees were requested to provide details regarding the occupation, industry, location and commencement date of their previous job. Three percent had no previous employment. Of the 4,734 respondents who had a previous job, the technicians were the most likely to have had a different occupation (58.4 percent). More than one-third of the professionals (38.2 percent) had a different previous occupation and tradesmen showed the least change (29.2 percent).

It is also noteworthy that over half (51.9 percent) of the mining industry's tradesmen came from other industries, indicating a high degree of skill transfer. Manufacturing and trade supplied 14.6 percent and 11.9 percent of the mining industry's tradesmen, respectively.

An analysis of training background also sheds some light on skill substitution. For instance, the majority of geological engineers are trained in geology rather than geological engineering. Among the technicians, mining technology appears to be the most transferable. Twenty-five percent of the industry's technicians are trained as mining technologists, yet only half of this number (12.4 percent) are actually employed as mining technologists. Of the three occupational groups, journeymen are the least likely to move out of their field of training. Among journeymen, however, the most skill substitution is found among steel fabricators, of whom approximately 15 percent have their certification in welding.

5. Employment Duration

Professionals show the shortest average duration with the same establishment - only 25 percent have over five years of service. This could be a reflection of higher turnover rates among professionals or it may be that professionals are transferred more readily among different establishments

within the same company. (NOTE: The survey captured movements between establishments but no attempt was made to analyze movements between companies.) Tradesmen showed the most longevity, with 37.3 percent with more than five years. Technicians fall in between - 31.0 percent having five years or more duration in their current establishment.

6. Conclusions

This survey is the first attempt by the province to gather information on characteristics of the work force in such a comprehensive manner. Gathering and processing the data proved to be highly staff-intensive and, as a result, consumed more time than had been anticipated. Nearly two-thirds of employers were unable to provide reliable forecasts of their manpower requirements. They were also not able to provide much information on the impact of technological change in the industry. Undoubtedly, provision of this kind of information was hampered by the drastic downturn in the economy which made it difficult for employers to evaluate future operating and market conditions.

Despite its shortcomings, the survey does provide a great deal of information about skill substitution, recruitment patterns, and previous training characteristics on a sub-regional and sub-industry basis. Overall, the survey is considered a successful pilot.

Copies of both reports are available from the Ministry of Labour. Further queries regarding methodology or additional tabulations should be directed to the Central Statistics Bureau, Ministry of Industry and Small Business Development.

III. PROFESSIONAL AND TECHNICAL

The employee survey generated a number of interesting observations relating to the professional and technical occupations. The information pertaining to immigration and training levels will be of particular interest to recruiters and trainers within the industry. The cross referencing of training background and present occupation is the first attempt of its kind in British Columbia.

The survey population by detailed occupation is presented on the next page. To ensure confidentiality, only the metallurgical engineers, mining engineers, geologists, systems analysts, accountants, draughtsmen, surveyors and assayers are disaggregated in the following tables. The remaining occupations are included in the appropriate "other" categories.

TABLE 4
SURVEY POPULATION
Professional and Technical

Occupation	Survey Population
Professional & Technical Totals	**1,561**
Professional Total	**899**
Total Engineers	335
Chemical Engineers	5
Metallurgical Engineers	59
Civil Engineers	15
Mechanical Engineers	34
Mining Engineers	152
Geological Engineers	31
Electrical Engineers	9
Petroleum Engineers	2
Environmental Engineers	7
Other Engineers	7
Unspecified Engineers	14
Total Scientists	350
Chemists	18
Geologists	299
Physical Metallurgists	9
Geophysicists	5
Meteorologists	2
Biologists	2
Environmental Planners	3
Other Scientists	11
Unspecified Scientists	1
Systems Analysts	49
Accountants	146
Economists	7
Lawyers	5
Librarians	1
Physicians	2
Nurses	4
Technical Total	**662**
Total Engineering and Science Technicians	613
Electronic/Electrical Technicians	3
Mining Technicians	76
Metallurgical, Process or Chemical Technicians	56
Mechanical Technicians	11
Environmental Technicians	26
Draughtsmen	81
Surveyors	102
Assayers	140
Geological Technicians	21
Prospectors	5
Government Engineering Technicians	1
Other Engineering and Science Technicians	43
Unspecified Engineering and Science Technicians	48
Other Technicians	49

1. Demographic Characteristics

a) Age

The age distribution by occupation displays a relatively consistent average age across the professional/technician group. Employees in the professional occupations tend to be older on average than those in the technician occupations. The relatively large percent of technicians under 25 may reflect the shorter training durations for these occupations.

In terms of specific occupations, only metallurgical engineering and accounting demonstrate a significant percentage of employees approaching retirement. Neither of these occupations is likely to incur serious problems in replacing these retirees.

TABLE 5
AGE CHARACTERISTICS
Professional and Technical

Occupation	Total	AGE (%)						Average Age
		Under 25	25 - 34	35 - 44	45 - 54	55 - 59	60 +	
Total Professional & Technical	1561	12.0	50.0	25.8	8.3	1.7	2.3	33.8
Total Professional	899	5.2	49.2	30.4	10.5	1.8	2.8	35.5
Total Engineers	335	5.2	53.6	23.0	12.3	2.5	3.3	35.7
Metallurgical Engineers	59	3.4	54.2	23.8	10.2	1.7	6.8	36.6
Mining Engineers	152	7.9	57.9	18.4	8.6	3.9	3.3	34.6
Other Engineers	124	2.6	47.9	28.7	18.3	.9	1.7	37.1
Total Scientists	350	5.8	45.9	36.9	9.1	1.5	.9	34.6
Geologists	299	6.0	48.8	35.1	7.3	1.7	1.0	34.1
Other Scientists	51	4.4	26.7	48.9	20.0	-	-	37.7
Systems Analysts	49	8.5	68.1	23.4	-	-	-	31.7
Accounting	146	3.4	39.7	33.6	14.3	2.1	6.9	38.5
Other Professional	19	-	61.2	33.3	-	-	5.6	35.9
Total Technicians	662	21.1	51.1	19.3	5.4	1.5	1.5	31.5
Total Eng. & Sc. Technicians	613	22.4	50.9	18.3	5.3	1.4	1.6	31.4
Draughtsmen	81	19.0	54.4	24.1	2.5	-	-	30.9
Surveyors	102	34.3	41.4	18.2	4.0	-	2.0	29.6
Assayers	140	20.7	34.3	27.1	9.3	4.3	4.3	34.9
Other Eng. & Sc. Technicians	290	19.7	63.0	11.6	4.4	.8	.4	30.6
Non Eng. & Sc. Technicians	49	6.8	52.2	31.8	6.8	2.3	-	33.1

b) Sex

The professional/technical occupations within the industry appear to be male-dominated, with females accounting for only 12 percent of total employment.

The technicians group has above-average female representation (approximately 1 in 5) with assayers approaching 1 in 3. Relatively few of the industry's engineers are women (2.5 percent). In this respect, mining is no different than other industries, since the 1981 Census reports that 2.1 percent of the equivalent engineers employed in British Columbia were female.

TABLE 6
FEMALE REPRESENTATION
Professional and Technical

Occupation	Total	% Female
Total Professional & Technical	1561	12.3
Total Professional	899	7.2
Total Engineers	335	2.5
Metallurgical Engineers	59	3.4
Mining Engineers	152	1.3
Other Engineers	124	3.5
Total Scientists	350	7.8
Geologists	299	8.4
Other Scientists	51	4.4
Systems Analysts	49	14.9
Accounting	146	11.6
Other Professional	19	33.3
Total Technicians	662	19.2
Total Eng. & Sc. Technicians	613	20.2
Draughtsmen	81	20.3
Surveyors	102	3.0
Assayers	140	32.9
Other Eng. & Sc. Technicians	290	20.5
Non Eng. & Sc. Technicians	49	6.8

2. Migration

The industry relies heavily on professionals and technical employees from outside the province. Table 7 shows the proportion of professionals and technicians who were qualified in their occupation prior to their most recent arrival in British Columbia. This "importation rate" shows British Columbia imports 77 percent of the engineers and 63 percent of the scientists who are employed in the mining industry.

The accountants and the "other professionals" have a relatively low importation rate of only 32.9 percent and 22.2 percent respectively. Overall, technicians have a

lower importation rate than professionals, with the exception of draughtsmen at 60.8 percent.

TABLE 7
IMPORTED SKILLED MANPOWER BY OCCUPATION
Professional and Technical

Occupation	Total	Employees Who Obtained Their Occupational Qualifications in B.C. and have Remained in B.C. (%)	Employees Who Were Qualified in Their Occupation Prior to Most Recent Arrival in B.C. (%)[1]
Total Professional & Technical	1561	46.3	53.7
Total Professional	899	37.8	62.2
Total Engineers	335	23.0	77.0
Metallurgical Engineers	59	33.9	66.1
Mining Engineers	152	17.1	82.9
Other Engineers	124	25.0	75.0
Total Scientists	350	37.2	62.8
Geologists	299	33.4	66.7
Other Scientists	51	58.8	41.2
Systems Analysts	49	42.6	57.4
Accountants	146	67.1	32.9
Other Professional	19	77.8	22.2
Total Technicians	662	57.9	42.1
Total Eng. & Sc. Technicians	613	57.3	42.7
Draughtsmen	81	39.2	60.8
Surveyors	102	62.6	37.4
Assayers	140	68.6	31.4
Other Eng. & Sc. Technicians	290	54.6	45.4
Non Eng. & Sc. Technicians	49	65.9	34.1

[1] Includes return migrants.

NOTE: This table does not necessarily represent the recruitment patterns of the mining industry as the migrants could have lived in British Columbia for many years prior to joining the mining industry.

The age at which these imported professionals and technicians arrived in British Columbia is summarized in Appendix C.1. The only point highlighted by the data is that qualified immigrants in technical occupations appear to arrive in British Columbia at a much earlier age than those in professional occupations. This probably reflects the shorter duration of their training programs.

To more completely understand the recruitment patterns of the mining industry itself, data were derived on the "place of residence immediately prior to current job" by occupation (Table 8). While 58.3 percent of the industry's professionals were recruited from British Columbia, there are a number of differences by specific occupation. A relatively large percentage of mining engineers was recruited from outside of B.C. (58.2 percent). This

consists of 10 percent from other countries and 48.2 percent from the rest of Canada. A possible explanation of this may be the industry's desire to ensure a mix of graduates from a broad selection of engineering schools. A large number of systems analysts are recruited from Alberta, (21.2 percent). This may be explained by the reputation and proximity of the Northern and Southern Alberta Institutes of Technology.

TABLE 8
RECRUITMENT PATTERNS OF THE MINING INDUSTRY
Professional and Technical

Occupation	Total	Place of Residence Immediately Prior to Current Job (%)		
		B.C.	Other Canada	Other World
Total Professional & Technical	1561	62.7	32.8	4.4
Total Professional	899	58.3	36.2	5.5
Total Engineers	335	51.9	41.5	6.6
Metallurgical Engineers	59	52.8	36.3	10.9
Mining Engineers	152	41.8	48.2	10.0
Other Engineers	124	63.1	35.1	1.8
Total Scientists	350	56.3	37.5	6.3
Geologists	299	53.3	39.5	7.2
Other Scientists	51	68.9	26.7	4.4
Systems Analysts	49	46.9	46.7	6.4
Accountants	146	78.5	20.0	1.5
Other Professional	19	77.8	16.7	5.6
Total Technicians	662	68.7	28.4	2.9
Total Eng. & Sc. Technicians	613	68.0	28.8	3.1
Draftsmen	81	65.3	30.6	4.0
Surveyors	102	74.7	23.1	2.2
Assayers	140	73.1	22.5	4.5
Other Eng. & Sc. Technicians	290	63.8	33.2	2.9
Non Eng. & Sc. Technicians	49	76.5	23.5	-

Technicians as a group are more likely to be hired from British Columbia than are professionals. Of the engineering and scientific technicians, only 32 percent were recruited from outside the province. In general, the more highly specialized an occupation, the farther afield the employer is inclined or must go to fill his vacancies.

To determine if there are any significant differences between sub-industries, regions or size of establishment with respect to their source of labour supply, the "place of residence immediately prior to current job" tabulations were done on these subsets and can be found in Appendix C.2. It appears that coal mines hire extensively from the rest of

Canada, 56.0 percent for the professionals, and 38.9 percent for the technicians. The regional disaggregated data shows the Interior and the Lower Mainland are more likely to recruit from within British Columbia. The Southeast stands out in terms of recruitment outside of British Columbia; many of their employees come from Alberta, undoubtedly reflecting the geographic proximity of the Alberta labour supply to the southeast corner of the province. Recruitment patterns by size of establishment revealed nothing of note.

The previous discussion covered migration into British Columbia from other provinces and countries. The table below shows the magnitude of movement within the province. A comparison was done between the region of the previous job and the region of the current job for those who changed jobs within British Columbia.

TABLE 9
EMPLOYEES WHOSE PREVIOUS JOB WAS IN B.C. BUT WITH A DIFFERENT ESTABLISHMENT THAN THEIR CURRENT JOB BY LOCATION OF CURRENT JOB AND LOCATION OF PREVIOUS JOB

Professionals

Location of Current Job	Location of Previous Job (%)				
	North	Interior	South East	Lower Mainland	Vancouver Island
North	(19.6)	5.9	-	74.5	-
Interior	6.0	(45.2)	9.5	27.4	11.9
Southeast	12.2	-	(24.4)	51.2	12.2
Lower Mainland	10.7	14.9	6.9	(60.9)	6.6
Vancouver Island	*	*	*	*	*

Technicians

Location of Current Job	Location of Previous Job (%)				
	North	Interior	South East	Lower Mainland	Vancouver Island
North	(44.7)	22.8	-	28.9	3.5
Interior	7.3	(62.9)	2.6	27.2	-
Southeast	21.6	12.5	(53.4)	12.5	-
Lower Mainland	-	-	6.7	(93.2)	-
Vancouver Island	*	*	*	*	*

* Estimates Unreliable

The bracketed numbers represent the proportion who changed establishments within British Columbia but remained in the same region. Professional recruitment is primarily done in the Lower Mainland with the exception of establishments in the Interior region where more than half of the professionals employed are recruited locally. Negligible recruitment is done locally by either Northern or Southeastern establishments.

Intraprovincial migration among professionals from the other regions to the Lower Mainland may partially reflect movement within the same company, that is, transfers from mine sites to head offices. Technicians exhibit less tendency to move from their region or alternatively employers do not have to hire beyond the local labour market as frequently to fill their technical vacancies.

3. Education

As would be expected, professionals and to a lesser extent, technicians are highly educated. Approximately 85 percent of all professionals have at least one university degree and 60 percent of all technicians have a college diploma or a university degree. Only 2.7 percent of professionals have no post secondary education and these are primarily systems analysts/computer programmers and accountants. For the most part, both groups have matriculated.

There are a few occupations which particularly stand out. The large proportion of accountants (20.5 percent) who have "course only or incomplete program" are mainly individuals currently enrolled in a Chartered General Accountant or Registered Industrial Accountant program. Of the engineers, the metallurgical group appear to be the most highly qualified with 27.1 percent having a post bachelor degree compared to the average of 14.8 percent for all engineers and 16.9 percent for all professionals. Scientists are also highly educated with an average of 26.2 percent having graduate degrees.

Among the technicians, the assayers present the most interesting mix of training backgrounds. Many assayers (22 percent) have university degrees, mostly in chemistry, and yet 34.3 percent needed no post secondary education to become assayers. The questions arise; if these two groups of assayers are performing different functions, if recruitment patterns have changed within the industry, or if there is some other explanation for this occurrence.

TABLE 10
MOST RELEVANT* EDUCATION QUALIFICATION BY OCCUPATION
Professional and Technical

Occupation	Total	Most Relevant Qualification (%)								
		No Post-Secondary Education	Course Only or Incomplete Program	College/ Under Graduate Diploma	Bachelor of Science	Other Bachelor	RIA CGA CA	Masters	Post Masters	Other
Total Professional & Technical	1561	11.3	11.3	22.2	35.4	3.9	5.1	7.4	2.7	.7
Total Professional	899	2.7	5.8	6.4	55.5	3.3	8.9	12.4	4.5	.5
Total Engineers	335	-	3.1	4.9	74.5	2.1	-	11.7	3.1	.6
Metallurgical Engineers	59	-	3.4	-	64.4	5.1	-	18.6	8.5	-
Mining Engineers	152	-	2.0	4.6	78.3	2.0	-	13.2	-	-
Other Engineers	124	-	4.4	7.8	74.8	.9	-	6.1	4.4	1.7
Total Scientists	350	0.3	0.9	2.3	68.6	1.7	-	19.8	6.4	-
Geologists	299	-	1.0	-	69.9	2.0	-	20.7	6.4	-
Other Scientists	51	2.2	-	17.8	60.0	-	-	13.3	6.7	-
Systems Analysts	49	14.9	17.1	25.5	17.0	14.7	-	6.4	-	4.3
Accountants	146	11.0	20.5	12.3	-	4.8	51.4	-	-	-
Other Professional	19	-	-	16.7	11.1	11.1	-	16.7	44.4	-
Total Technicians	662	23.0	18.7	43.5	8.2	4.7	-	.5	.3	1.1
Total Eng. & Sc. Technicians	613	21.5	17.8	45.9	8.3	4.6	-	.5	.4	1.1
Draughtsmen	81	10.1	26.6	53.2	1.3	5.0	-	-	-	3.8
Surveyors	102	26.3	21.2	41.4	2.0	9.1	-	-	-	-
Assayers	140	34.3	7.1	36.4	17.9	.7	-	2.1	1.4	-
Other Eng. & Sc. Technicians	290	16.1	19.6	50.6	7.6	4.8	-	-	-	1.2
Non Eng. & Sc. Technicians	49	43.2	29.6	13.6	6.8	6.8	-	-	-	-

* In cases where more than one degree is held, the degree associated with the most relevant field of study to the occupation is tabulated.

Data on the age when the qualified labour force flows from the education institutions into the job market can be found in Appendix C.3 and the location where these most relevant degrees were obtained in Appendix C.4.

4. Occupational/Skill Mobility or Substitution

One of the principal questions which led to the development of this survey was to identify the extent to which skills are transferable across occupations. To address this question information was collected which would facilitate the following comparisons within the mining industry: training to present occupation; present occupation to previous occupation; and professional/technician occupations to management. Information was also derived which sheds some light on inter-industry mobility.

According to Table 11, the geologists and the accountants appear to be the most discrete occupations among the professions: almost all have degrees in geology and accounting respectively. Specific engineering occupations within the industry appear to allow significant substitution or transfer of skills from other engineering training programs. Of interest are the metallurgical engineers which show only a little more than one third with metallurgical engineering degrees. Systems analysts appear to have the most varied educational background of the professional occupations; this probably reflects the relatively recent development of the occupation.

TABLE 11
PROFESSIONALS WITH A UNIVERSITY DEGREE
BY DISTRIBUTION OF FIELD OF STUDY OF MOST RELEVANT DEGREE

Metallurgical Engineers	
Metallurgical Engineering	36.8%
Mining Engineering	29.8
Other Engineering	12.3
Metal Materials Science	12.3
Chemistry or Math	8.8
Mining Engineers	
Mining Engineering	64.8%
Geological Engineering	9.2
Mineral Engineering	4.2
Other Engineering	4.9
Engineering - Unspecified	6.3
Geology	7.0
Other Science	3.5

TABLE 11 (cont'd)

Civil Engineers	
Civil Engineering	61.5%
Other Engineering	38.5
Mechanical Engineers	
Mechanical Engineering	65.5%
Mine Engineering	20.7
Other Engineering	13.8
Geological Engineers	
Geology	62.5%
Geological Engineering	37.5
Geologists	
Geology & Related	84.8%
Geological Engineering	7.1
Other Science	8.1
Chemists	
Chemistry	80.0%
Other Science	20.0
Systems Analysts	
Computer Science	22.2%
Mathematics	22.2
Other Science	27.8
Non Science	27.8
Accountants	
Accounting	92.7%
Commerce/Economics	7.3

Within the technical occupations a diploma in mining technology appears to be the most transferable. While the occupation of mining technician represents only 12.4 percent of the total technicians in the industry, over 25 percent of

all the certified technicians in the industry are trained in the field of mining technology: 87.5 percent of the geological technicians, 34.1 percent of surveyors and 29.4 percent of assayers were trained in that discipline.

TABLE 12
TECHNICIANS WITH A COLLEGE DIPLOMA BY DISTRIBUTION OF FIELD OF STUDY OF MOST RELEVANT DEGREE

Draughtsmen	
Drafting	50.0%
Civil & Structural Technology	11.9
Other Technology	26.2
Other	11.9
Surveyors	
Survey Technology	34.1%
Mining Technology	34.1
Engineering Sciences	12.2
Other	19.6
Assayers	
Chemical & Metallurgical Technology	58.8%
Mining Technology	11.8
Practical Nursing	9.8
Other	19.6
Mining Technicians	
Mining Technology	54.2%
Geology	12.5
Engineering Science	10.4
Other	22.9
Metallurgical, Process or Chemical Technicians	
Chemical & Metallurgical Technology	72.7%
Mining Technology	18.2
Other	9.1
Geological Technicians	
Mining Technology	87.5%
Other	12.5

The transferability of skills between occupations, that is the extent of occupational mobility, was also examined. To

qualify as having a transferable set of skills from one occupation to another, the respondent had to demonstrate that the same set, or subset, of skills was being utliized in both previous and current occupations. If five or more individuals met this criteria then the occupations were considered mobile. However mobility should be considered only in the direction from previous to current occupation.

TABLE 13
INDICATION OF OCCUPATIONAL MOBILITY
Professional & Technical

PREVIOUS OCCUPATION		CURRENT OCCUPATION
Physical Metallurgist	———	Metallurgical Engineer
Geological Engineer Geologist	) ———)	Mining Engineer
Geologist	———	Geological Engineer
Geologists Surveyors Geological Technicians	)) ———)	Mining Technicians
Assayers	———	Metallurgical, Process or Chemical Tech.
Surveyors	———	Draughtsmen

Professionals and technicians are also occupationally mobile into management, particularly into administration. The next table shows promotion into management by detailed occupation. The left hand column lists the previous occupation of the respondents and the body of the table shows the distribution of those who changed jobs by same or different current occupation. The proportion who changed occupations but did not move into management is shown in the right hand column.

TABLE 14
OCCUPATIONAL ATTRITION STATUS BETWEEN PREVIOUS JOB
AND CURRENT JOB BY PREVIOUS OCCUPATION
Professional and Technical

Previous Occupation	Percent With Same Occupation As Previous Occupation	% With A Different Occupation from Previous Occupation		
		Mgmt/Admin	Foremen	Other
Total Professional & Technicians	55.1	10.2	2.3	32.4
Total Professional	61.8	13.7	.3	24.1
Total Engineers	51.1	13.8	-	35.1
Metallurgical Engineers	42.9	-	-	57.1
Mining Engineers	71.0	21.5	-	7.5
Other Engineers	32.5	11.4	-	56.1
Total Scientists	66.4	14.1	.9	18.6
Geologists	73.6	12.2	-	14.2
Other Scientists	25.9	25.9	5.6	42.6
Systems Analysts	76.0	8.0	-	16.0
Accountants	75.7	15.6	-	8.7
Other Professional	24.3	8.1	-	67.6
Total Eng. & Sc. Technicians	45.1	4.8	5.3	44.8
Draughtsmen	69.2	1.9	-	28.9
Surveyors	49.0	5.7	-	45.3
Assayers	46.7	8.9	6.6	37.8
Other Eng. & Sc. Technicians	36.6	3.0	8.0	52.4

The data indicate that 14.0 percent of those who had been professionals and 10.1 percent of those who had been technicians moved into management. (The age at which they made that move is detailed in Appendix C.5). Among the technician occupations, assayers displayed the greatest likelihood to move into management. No attempt was made to distinguish between types and levels of mangement positions.

Table 15 gives an indication of the mobility of skills from other industries to the mining industry. Many of these occupations demonstrate virtually no industrial mobility primarily because the skills of the encumbents are so specialized to mining. This is particularly the case for the geologists, mining engineers, metallurgical engineers and their counterpart technicians. Notwithstanding this, these occupations do demonstrate some transferability from the "financial and other service" companies which in these cases consist primarily of engineering and scientific consulting companies. Many draughtsmen, as would be expected, had experience with architectural firms.

TABLE 15
EMPLOYEES WHO WERE EMPLOYED IN THE SAME OCCUPATION IN THEIR PREVIOUS JOB
BY INDUSTRY OF PREVIOUS JOB
Professional and Technical

Occupation	All Industries	INDUSTRY OF PREVIOUS JOB (%)								
		Forestry	Mining	Wood & Paper Mfg.	Other Mfg.	Construction	Trans. & Comm.	Trade	Financial & Other Services	Public Admin
Total Prof. & Tech	528	0.2	69.7	0.9	3.4	-	1.5	1.5	18.8	4.0
Total Prof.	390	0.3	70.0	0.5	2.6	-	2.0	2.0	18.2	4.4
Total Eng.	103	-	77.7	1.0	5.8	-	1.0	-	11.6	2.9
Metall. Eng	13	-	84.6	-	-	-	-	-	-	15.4
Mining Eng	66	-	81.8	-	6.1	-	-	-	12.1	-
Other Eng	24	-	62.5	4.2	8.3	-	4.2	-	16.7	4.2
Total Scientists	183	-	83.1	-	0.5	-	-	-	12.6	3.8
Geologists	168	-	83.9	-	-	-	-	-	13.1	3.0
Other Scientists	15	-	73.3	-	6.7	-	-	-	6.7	13.3
Systems Analysis	14	7.1	21.4	6.2	-	-	-	-	35.7	28.6
Accountants	78	-	44.9	-	3.8	-	6.4	10.3	32.1	2.6
Other Prof.	12	-	25.0	-	-	-	16.7	-	50.0	8.3
Total Technicians	138	-	68.8	2.2	5.8	-	-	-	20.3	2.9
Total Eng & Sc. Tech.	128	-	68.8	-	6.2	-	-	-	21.9	3.1
Draughtsmen	34	-	52.9	-	5.9	-	-	-	38.2	2.9
Surveyors	27	-	70.4	-	-	-	-	-	29.6	-
Assayers	21	-	85.7	-	14.3	-	-	-	-	-
Other Eng. & Sc.Tech	46	-	71.7	-	6.5	-	-	-	15.2	6.5
Non Eng. & Sc. Tech.	10	-	70.0	30.0	-	-	-	-	-	-

5. Employment Duration

This section examines the length of time individuals have remained with the same establishment by detailed occupation. Mining engineers once more stand out as the exception with a significantly higher proportion (over 50 percent) having less than two years tenure with their current employer. This may be related to the information in Table 11 which indicates that mining engineers have a higher percentage of their numbers in the 25-34 age cohort than any other engineering occupation. Systems analysts also appear to demonstrate short tenure periods but this could also be misleading. The figures could merely be a reflection of the relatively recent development of the occupation.

TABLE 16
DURATION OF EMPLOYMENT WITH CURRENT EMPLOYER
Professional and Technical

Occupation	Total[1]	Duration (%)				Average[2] Number of Years
		Less Than 2 Years	2 - 5 Years	6 - 9 Years	10 Years Plus	
Total Professional & Tech.	998	31.7	40.5	12.1	15.7	3.90
Total Professional	582	29.0	45.4	13.9	11.7	3.72
Total Engineers	230	42.2	39.1	12.6	6.1	3.05
Metallurgical Engineers	43	35.0	30.0	25.0	10.0	4.25
Mining Engineers	111	50.9	34.5	7.3	7.3	2.64
Other Engineers	76	32.6	52.2	13.0	2.2	3.02
Total Scientists	201	22.9	47.8	13.4	15.9	4.00
Geologists	176	24.8	50.4	14.6	10.2	3.69
Other Scientists	25	11.8	29.4	5.9	52.9	6.53
Systems Analysts	41	30.3	57.6	9.1	3.0	2.67
Accountants	94	12.5	48.2	19.6	19.7	4.93
Other Professional	16	15.4	53.8	15.4	15.4	4.15
Total Technicians	416	35.3	33.7	9.6	21.4	4.20
Total Eng. & Sc. Tech.	393	37.4	32.3	9.7	20.6	4.14
Draughtsmen	58	47.0	26.5	11.8	14.7	3.44
Surveyors	59	37.8	32.4	10.9	18.9	3.84
Assayers	81	18.4	30.6	14.3	36.7	6.04
Other Eng. & Sc. Tech.	195	42.5	34.9	6.6	16.0	3.58
Non Eng. & Sc. Tech.	23	-	55.6	11.1	33.3	5.89

1 Included are only those employees who worked for an establishment that has been in operation for 10 or more years.

2 Employees who have worked for more than 10 years are counted as having worked for 10 years.

Technicians as a group show longer duration of employment (4.2 years) compared to the professionals (3.7 years). Of interest is the considerably larger proportion of technicians with over 10 years of service. Assayers demonstrate the longest average tenure (6.0 years) with over one third having been with the same establishment for over 10 years.

When analyzing this data, it is important to keep in mind the extent to which promotion into management may distort the results. Table 14 on page 20 showed that a larger proportion of professional employees are recruited into management than are technicians. The difference in length of service between the two groups of employees may merely reflect this greater tendency for professionals to be promoted into management.

Included in the Appendix are tabulations on employment duration by sub-industry and region (Appendix C.6). They show that technicians' average duration in the Interior is significantly longer than in the other regions. For both professional and technical groups, there appears to be higher turnover in the non-metal sub-industry.

IV. APPRENTICEABLE TRADES OCCUPATIONS

All journeymen, regardless of certification status, and their assistants* were included in the survey population. The distribution of journeymen by occupation is itemized below:

TABLE 17
SURVEY POPULATION BY OCCUPATION
Tradesmen

TRADE	JOURNEYMEN		ASSISTANTS	
	No.	% of Total	No.	% of Total
Millwrights	581	19.4	53	16.2
Heavy Duty Mechanics	860	28.7	80	24.5
Automotive Mechanics	92	3.1	3	.9
Winder Electricians	4	.1	-	-
Telecommunication Electricians	3	.1	-	-
Other Electricians	441	14.7	6	1.8
Electronic Technicians	14	.4	-	-
Instrumentation Mechanics	44	1.5	3	.9
Welders	461	15.4	34	10.4
Steel Fabricators	30	1.0	-	-
Machinists	103	3.4	1	.3
Steamfitters/Pipefitters	59	2.0	-	-
Carpenters	109	3.6	11	3.4
Bricklayers	6	.2	-	-
Painters	16	.5	3	.9
Sheet Metal Workers	9	.3	-	-
Steam Engineers	32	1.1	8	2.4
Linemen	12	.4	0	-
Industrial Warehousemen	34	1.1	106	32.4
Blacksmith	8	.3	-	-
Plumber	9	.3	-	-
Rubber/Plastic Fabricator	6	.2	-	-
Partsmen	5	.2	-	-
Leadburner	2	.1	-	-
Oil Burner Repairmen	2	.1	-	-
Tiremen	12	.4	-	-
Unspecified Trades	9	.3	19	5.8
ALL TRADES	2963		327	
Multi-skilled	31		-	
GRAND TOTAL	**2994**	**100.0**	**327**	**100.0**

* Those who perform similar tasks as journeymen but always under the supervision of a journeyman. Does not include apprentices.

While a wide array of the skilled trades is employed in the mining industry, 78% of all journeymen fall into four trade categories - millwrights, heavy duty mechanics, electricians and welders. If carpenters, machinists and auto mechanics are included in this group then these seven trades account for 88% of journeymen employed in mining. As Report I indicated, the mining industry is a prolific trainer but as can be seen from the foregoing the skills requirement in this industry falls into a fairly narrow range.

The following analysis was undertaken on a broad aggregate level. The tables in this chapter separately consider the four principal mining trades of millwrights, heavy duty mechanics, electricians and welders. All other trades are summed in the "Other Journeymen" category. The "All Tradesmen" category includes assistants and is to be regarded as a grand total. Assistants are considered at the aggregate level only. The data was assembled in this manner to ensure confidentiality with respect to respondents and to maintain a sample size large enough to ensure statistical reliability.

1. Demographic Characteristics

Age and Sex

Age and sex profiles of tradesmen are presented below. Very few females are employed as journeymen. The relatively large proportion of females represented in the Assistant category consists primarily of industrial warehousemen assistants, who are employed as warehouse clerks. This same group similarly accounts for the high proportion (20.9 percent) of "under 25 years of age" working as assistants. The average age column indicates that there is little variation in age among journeymen. Millwrights, however, appear to have a comparatively larger proportion over the age of 60.

TABLE 18
AGE CHARACTERISTICS
Tradesmen

Occupation	Total	AGE (%)						Average Age
		Under 25	25-34	35-44	45-54	55-59	60+	
All Tradesmen	3321	6.3	42.6	29.7	13.1	4.4	4.0	37.0
Total Journeymen	2994	4.7	44.6	30.3	13.2	3.7	3.5	36.9
Millwrights	581	7.1	40.9	30.7	11.9	2.9	6.5	37.6
Heavy Duty Mechanics	860	6.2	46.2	28.4	13.1	3.2	2.8	36.3
Electricians	441	1.4	44.0	38.9	10.3	3.7	1.8	36.8
Welders	461	6.9	44.4	28.2	14.1	5.2	1.1	36.2
Other Journeymen	651	1.5	46.3	27.6	15.9	4.0	4.7	37.6
Journeymen's Assistants	327	20.9	24.1	24.5	12.0	10.4	8.0	38.3

TABLE 19
FEMALE REPRESENTATION
Tradesmen

Occupation	Total	% Female
All Tradesmen	3321	1.6
Total Journeymen	2994	.5
Millwrights	581	-
Heavy Duty Mechanics	860	-
Electricians	441	-
Welders	461	1.1
Other Journeymen	651	1.1
Journeymen's Assistants	327	12.0

2. Migration

A comparison of tradesmen who acquired their skills prior to their most recent arrival in British Columbia is provided below. Electrician journeymen stand out with 59 percent coming from outside the province, compared to the journeymen average of 46 percent. Of further note, only 37 percent of the millwrights are imported.

TABLE 20
IMPORTED SKILLED MANPOWER BY OCCUPATION
Tradesmen

Occupation	Total	% Who Obtained Their Occupational Qualifications in BC and Remained in BC	% Who Were Qualified Prior to Most Recent Arrival in BC
All Tradesmen	3321	56.0	44.0
Total Journeymen	2994	54.3	45.7
Millwrights	581	63.0	37.0
Heavy Duty Mechanics	860	58.7	41.3
Electricians	441	40.7	59.3
Welders	461	50.6	49.4
All Other Journeymen	651	52.9	47.1
Journeyman's Assistants	327	70.6	29.4

Appendix D.1 provides an age distribution of migrants to B.C. by age on arrival date. Of the 213 imported millwrights, there appears to be a higher proportion who migrated when over the age of 34 (43 percent) compared to the journeymen average of 35 percent.

To attempt to understand recruitment patterns in the mining industry, a variable was derived for the "Place of Residence Immediately Prior to Commencing the Job With the Current Employer". This was done by comparing the dates when the individual last arrived in B.C. to the date he commenced his current job. Table 21 shows the proportion of tradesmen who were living in British Columbia at the time they took their current job and those who came from other provinces or countries. Little variation is seen among the proportion of trades supplied from within British Columbia. The exception is again electricians who largely come from out of province.

TABLE 21
RECRUITMENT PATTERNS IN THE MINING INDUSTRY
Tradesmen

Occupation	All	Place of Residence Immediately Prior to Job with Current Employer (%)								
		B.C.	Alta.	Other Prairie	Ont.	Rest of Canada	USA	U.K.	Other Europe	Rest of World
Total Tradesmen	3321	63.1	10.2	5.0	8.7	8.3	0.2	1.5	1.0	2.0
Total Journeymen	2994	61.4	10.9	5.5	8.6	8.6	0.2	1.6	1.1	2.1
Millwrights	581	62.6	9.1	4.3	8.8	7.6	0.7	3.0	-	3.9
Heavy Duty Mech.	860	62.3	11.1	4.1	9.0	8.9	0.4	1.1	1.1	2.0
Electricians	441	46.7	14.4	11.4	12.9	7.9	-	3.7	0.7	2.2
Welders	461	63.3	10.2	6.1	7.1	10.2	-	-	2.8	0.2
Other Journeymen	651	67.6	10.2	4.1	5.8	8.3	-	1.0	1.2	1.8
Journeymen Assist.	327	78.1	3.6	-	10.5	5.5	-	0.9	-	1.4

Comparisons of sources of supply of tradesmen among different regions of the province, among the various mining sub-industries and among the different sizes of mines are included in Appendix D.2. Coal mines and therefore the southeast region of the province, recruit a relatively large proportion of their tradesmen from the rest of Canada. When viewed from a "Size of Establishment" perspective, the smaller the establishment the more likely the tradespeople were supplied from within B.C.

The next table is included to demonstrate the degree of intraprovincial mobility among tradesmen. The left hand column shows the region of the current job for those tradesmen whose previous job had been in B.C. and who had actually changed establishments between their last job and their current job. Those who have been promoted within a firm are not included in this table. The bracketed numbers represent the proportion of B.C. tradesmen who were recruited within the same region. The others show the percentage recruited from other B.C. regions.

TABLE 22
RECRUITMENT FROM WITHIN B.C.
Tradesmen

Region of Current Job	Region of Previous Job (%)				
	North	Interior	Southeast	Lower Mainland	Vancouver Island
North	(43.9)	11.0	7.7	25.2	12.3
Interior	13.4	(62.8)	3.6	17.8	2.4
Southeast	10.1	9.2	(57.8)	11.9	11.0
Lower Mainland	20.0	-	-	(80.0)	-
Vancouver Is.	*	*	*	*	*

*Estimates Unreliable

Establishments in the North appear to have to recruit outside their region more than establishments located in the other regions. The relative isolation of this area of the province may contribute to a lack of skilled tradesmen locally.

3. Education

Table 23 shows the distribution of post secondary degrees held by trades people. Journeymen without any post-secondary education represent 13.8 percent of all journeymen whereas 67.7 percent have certificates. This includes both those who completed an official apprenticeship program as well as those who successfully passed a Tradesmen's Qualification Exam without formal indentureship. Because there are many different ways to receive training, (i.e. as part of other trades training), relatively few welders (49 percent) have certificates. This is not to suggest that most welders have no post-secondary training; for the most part, those without journeymen certificates have completed at least one course in welding. Steam engineers, like welders, have a fairly low certification rate, but 50 percent have completed a power engineering course.

TABLE 23
MOST RELEVANT EDUCATION QUALIFICATION BY OCCUPATION
Tradesmen

Occupation	Most Relevent Qualification (%)							
	Total	No Post Sec. Educ	Course Only or Incomplete Program	Armed Forces Qualif	Pre-App Program	Jrnyman Tickets	College Diploma	Other
All Apprenticeable Trad	3321	16.6	10.5	2.3	3.6	62.3	4.3	0.3
Total Journeymen	2994	13.8	8.7	1.8	3.8	67.7	3.9	0.2
Millwrights	581	18.3	2.4	1.7	3.4	71.6	2.6	-
Heavy Duty Mechanics	860	18.9	6.7	1.6	4.7	66.8	1.2	-
Electricians	441	4.6	2.5	3.0	1.8	77.1	10.5	0.5
Welders	461	9.8	26.9	-	6.1	49.9	7.4	-
Other Journeymen	651	12.3	8.1	2.7	2.9	71.6	1.8	0.5
Journeymen's Assistants	327	42.6	27.3	6.8	1.6	12.4	8.4	0.8

A table on the location of Most Relevant Post Secondary Education is included in Appendix D.3. It shows that just over 50 percent of journeymen were British Columbia trained. Again, this number could include those who did their on-the-job training outside of British Columbia but later wrote the Tradesmen Qualification Exam. The large representation of "other journeymen" from "other Europe" is comprised primarily of carpenters and machinists.

4. Occupational/Skill Mobility or Substitution

For certified journeymen, data were compiled on the field of study of the "most relevant" certification. Where less than five individuals were observed in a particular field of study, that field of study was included in the "other category". It is not too surprising that the data show a high consistency between the occupation and the type of trade certification. 98.8 percent of certified electricians have been trained in some type of electrical work. Significant skill substitution is found among heavy duty mechanics of whom 9 percent are trained in auto mechanic repairs, and among steel fabricators, 14.8 percent of whom are welders.

TABLE 24
CERTIFIED JOURNEYMEN BY DISTRIBUTION OF
FIELD OF STUDY OF MOST RELEVANT CERTIFICATION

Millwrights	
Millwrights	88.1%
Heavy Duty Mechanics	2.4
Automotive Mechanics	2.4
Diesel Engine Mechanic	1.7
Plumbing/Steam Pipefitting	2.7
Other	2.7
Heavy Duty Mechanics	
Heavy Duty Mechanics	83.6%
Automotive Mechanic	9.0
Millwright	.9
Diesel Engine Mechanic	1.2
Mechanic Unspecified	3.0
Welding	.9
Other	1.4
Electricians	
Electrician - Unspecified	79.5%
Industrial Electrician	16.9
Construction Electrician	2.4
Other	1.2
Welders	
Welding	93.4%
Boilermaker	2.2
Other	4.4
"Other" Journeymen with Tickets	
Auto Mechanics	
Auto Mechanics	94.2%
Other	5.8
Instrumentation Mechanics	
Industrial Instrumentation	100.0%
Steel Fabricators	
Steel Fabricating	74.1%
Welders	14.8
Other	11.1
Machinists	
Machinery	90.9%
Other	9.1
Steamfitters and Pipesetters	
Plumbing and Steam Pipefitting	91.7%
Other	8.3

TABLE 24 (cont'd)

Carpenters	
Carpentry - Unspecified	84.1%
Carpentry/Joinery	15.9
Bricklayers	
Brick, Stone and Concrete	100.0%
Sheet Metal Workers	
Sheet Metal	100.0%
Steam, Engineers	
Power Engineering	100.0%
Industrial Warehousemen	
Partsman	88.2%
Other	11.8
Plumbers	
Plumbing and Steam/Pipefitting	85.7%
Other	14.3

Tables were compiled on the comparative certification rate (proportion of journeymen with tickets) among the sizes of establishment, the mining sub-industries and the regions of the province. These tables can be found in Appendix D.4. The data show a consistent pattern of certification rate by size of establishment; the larger the establishment the greater the certification rate. Coal mines and the corresponding southeast region of the province show the highest proportion of certified journeymen.

Included in this section are tables on industrial and occupational mobility and attrition into management as well as tables illustrating the industry and location of apprenticeship training. Respondents who had served an apprenticeship were requested to give the name and industry of their sponsoring employer. Table 25 shows the industry of apprenticeship by occupation. Overall, 55.3 percent of the journeymen who responded to the question had served their apprenticeship in the mining industry. Millrights show a substantially larger proportion (64.4 percent) trained by the mining sector and a further 10 percent by the wood products industries. The reason for the low proportion of the "other journeymen" trained internally is that the "other" consists of many occupations with few employees and relatively less training is done in these low demand trades. The wholesale and retail trade industry trained 24 percent of the heavy duty mechanics (mainly the heavy equipment suppliers) and 18 percent of the "other journeymen" who in this case are primarily auto mechanics sponsored by car dealerships and service stations. Of note is the fact that over

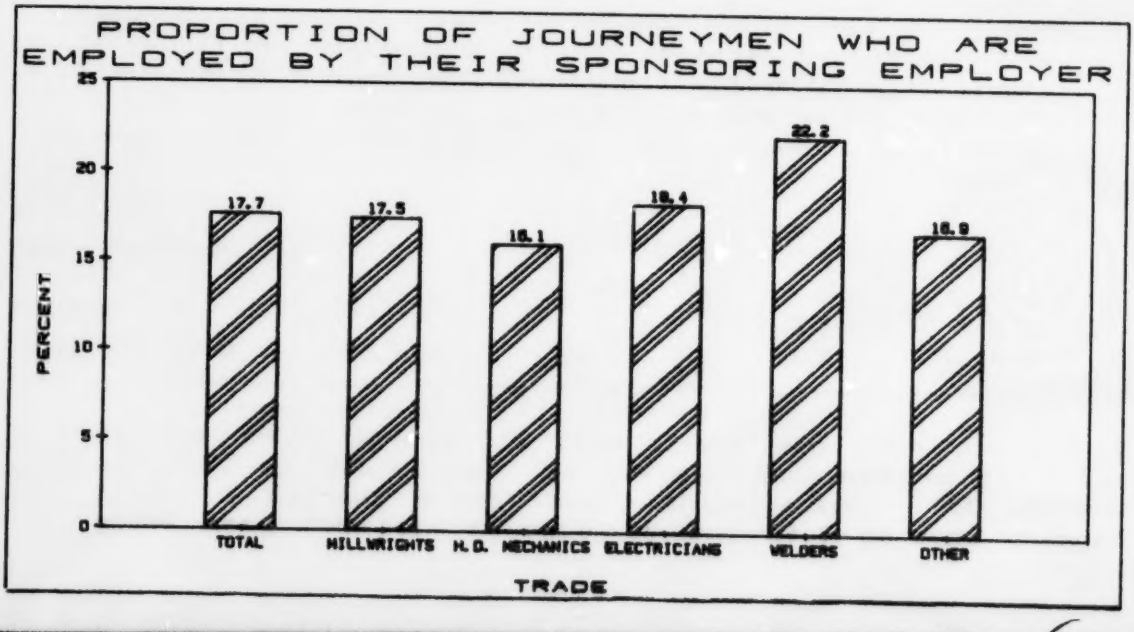
4 percent of both heavy duty mechanics and electricians received their training from the Armed Forces; and the construction sector is a major supplier of the mining industry's electricians.

TABLE 25
JOURNEYMEN WHO INDICATED THEY PARTICIPATED IN AN APPRENTICESHIP PROGRAM*
By Industry of Apprenticeship

Occupation	All Industries	Industry of Apprenticeship (%)								
		Forestry	Mining	Wood & Paper Mfg.	Other Mfg.	Const.	Transp & Commun	Trade	Services	Armed Forces
All Journeymen	1930	2.0	55.3	3.0	10.3	9.3	2.2	12.1	3.4	2.5
Millwrights	380	0.9	64.4	8.8	12.9	4.4	0.9	3.5	2.1	2.1
Heavy Duty Mech.	565	6.0	53.8	-	3.0	1.2	2.3	24.1	5.1	4.4
Electricians	380	-	58.2	2.3	6.1	22.2	3.5	1.6	1.9	4.2
Welders	191	-	57.2	-	24.5	8.2	-	5.7	4.4	-
Other Journeymen	414	0.9	44.3	3.0	14.1	13.5	3.0	18.0	3.3	-

The following chart gives the percentage of journeymen who are still employed by their sponsoring employer (establishment). These numbers should not be misconstrued as apprentice retention rates but rather as a combination of retention rates and the amount of training done by establishments in the mining industry in the past. Thus, the table shows the proportion of an establishment's journeymen work force which has been trained internally. In the mining industry on the average, each establishment has trained 17.7 percent of its own journeymen. Comparisons of this apprentice training/retention rate among size of establishment, sub-industry and region of B.C. are included in Appendix D.5.

Figure 2



For all journeymen who completed their apprenticeship training in British Columbia a cross tabulation was done on the Region of Apprenticeship training by the "Region of Current Employer". The proportion of journeymen who completed their apprenticeship in one region of the province and have remained in the same region gives an indication of relative apprentice retention rates by region. However, this has the shortcoming once again of only capturing those journeymen who have remained in the mining industry.

TABLE 26
PROPORTION OF JOURNEYMEN WHOSE SPONSORING EMPLOYER AND CURRENT EMPLOYER ARE IN THE SAME REGION
by Region of Sponsoring Employer

Region of Sponsoring Employer	% Currently Employed in the Same Region
North	79.0
Interior	84.8
Southeast	88.2
Lower Mainland	*
Vancouver Island	*

* Estimates Unreliable

Table 26 shows that 79 percent of journeymen currently employed by the mining industry who took their apprenticeship training in the North have remained in the North. Of the regions for which reliable estimates can be provided, the Southeast has the highest retention rate and the North the lowest.

Occupational mobility is defined as a set of skills used in one occupation which can be utilized in another occupation with minimal retraining. The following list of trades shows substitution possibilities (only in the one direction from previous job to current job).

TABLE 27
OCCUPATIONAL MOBILITY
Journeymen

PREVIOUS JOB		CURRENT JOB
Heavy Duty Mechanic Steamfitters/Pipefitters Instrumentation Mechanics Welders	————	Millwright
Auto Mechanics Millwrights Power Engineers	————	Heavy Duty Mechanics
Steel Fabricators	————	Welders
Millwrights	————	Machinists

Journeymen are also occupationally mobile into the management category particularly into the foremen category. By grouping the respondents according to their former occupation and then observing to which occupation they moved, we can calculate the attrition rate of journeymen into management. The table below lists the previous occupations of the respondents in the left hand column with the percentage distribution according to their current occupation in the body of the table.

TABLE 28
OCCUPATIONAL ATTRITION STATUS BETWEEN
PREVIOUS JOB & CURRENT JOB BY PREVIOUS OCCUPATION
Journeymen

Previous Occupation	Percent with Same Occupation as Previous Occupation	Percent with a Different Occupation from Previous Occupation		
		Management Administration	Management Foremen	Other
Total Journeymen	74.0	1.0	11.4	13.6
Millwrights	78.8	0.7	12.6	7.9
Heavy Duty Mech.	73.9	0.7	17.6	7.8
Electricians	90.1	0.3	6.4	3.2
Welders	90.9	-	2.9	6.2
Other Journeymen	46.3	2.8	11.5	39.4

Of the total number of respondents who were previously employed as journeymen, 74 percent remained in the same trade, 1 percent moved into administration, 11.4 percent moved into the foremen category and 13.6 percent changed

occupations (possibly a change in trade or a move out of the trades into another non-management occupation). Those journeymen who became managers did so at a surprisingly young age (see Appendix D.6). For example, over 70 percent of the electricians who become managers were under the age of 35.

5. Employment Duration

There is little variation in length of service with the same employer among the trades except that journeyman assistants appear to have a relatively high turnover rate with approximately 75 percent with less than six years service. Journeymen have an average duration with the same establishment of 4.7 years, ranging from 4.4 years for welders to 5.1 years for millwrights. Appendix D.7 shows the tradesmen average duration of employment by region, sub-industry and size of establishment. Of interest in these comparisons is the seemingly lower turnover in the coal mines and the corresponding southeast region of the province.

TABLE 29
DURATION OF EMPLOYMENT WITH CURRENT EMPLOYER
Tradesmen

Occupation	Total[1]	Duration (%)				Average No.[2] of Years
		Less Than 2 Years	2 - 5 Years	6 - 9 Years	10 Years	
All Tradesmen	2697	21.5	41.2	24.7	12.6	4.6
Total Journeymen	2392	20.3	40.9	25.2	13.6	4.7
Millwrights	455	18.5	38.8	24.2	18.5	5.1
Heavy Duty Mech.	677	25.8	36.2	26.4	11.6	4.5
Electricians	357	21.7	40.4	25.0	12.9	4.5
Welders	385	21.5	45.0	20.3	13.2	4.4
Other Journeymen	518	11.3	47.6	29.0	12.1	5.0
Journeyman's Assistants	305	33.3	43.6	20.5	2.6	3.3

1 Included are only those employees who work for an establishment that has been in operation for 10 or more years.
2 Employees who have worked for over 10 years are counted as having worked for 10 years in the calculation of the average.

Surprisingly, there is little variation among the other regions of the province; the North and the Interior both average 4.1 years of service. Comparisons among tradesmen by size of establishment, show that those with fewer than 100 employees, have a noticeably longer average duration of employment.

APPENDICES

APPENDIX A

Highlights of Manpower Study of the Mining Industry Report I

The report addresses four broad topics: 1) Total Employment; 2) Distribution of Occupations; 3) Age Structure of the Mining Work Force, and 4) Apprenticeship Training Ratios. The major findings are summarized below:

a) In terms of employment, the mining industry is dominated by a relatively small number of large employers.

b) The mining industry work force is relatively young compared to the Provincial work force as a whole.

c) The larger firms do most of the training. This is not surprising as the larger firms tend to employ most of the journeymen. Based on other sources (e.g. Critical Trade Skills Survey) it can be said that the industry appears to have a better training record than other industries.

d) The type of mining activity rather than size of establishment or geographical location is the most meaningful determinant of such factors as occupational distribution and work force age.

e) Sand pits and quarries, though considered technically to be part of the mining industry, displayed markedly different characteristics than the rest of the industry.

f) Regional data was collected but with the exception of the Apprenticeship Training Ratios did not provide significant insight into the occupational mix of the industry.

APPENDIX B

BRITISH COLUMBIA MANPOWER SURVEY

0103

For Office Use

The information requested on this questionnaire is needed to assist industry, labour organizations, and government in planning to meet British Columbia's demands for skilled labour in the future. All individual information will be kept strictly confidential and will be used only for producing statistical summaries. Your completed questionnaire should be mailed directly to the Ministry of Labour in Victoria in the envelope provided.

1. Year of birth [1 9 . .]

2. Sex [1] Male [2] Female

3. (a) Have you always lived in B.C.? [1] Yes - go to question 4. [2] No - go to question 3(b).

(b) Year of most recent move to B.C. [1 9 . .]

(c) Where did you live immediately prior to moving to B.C.? _____ (Province, or other Country)

4. (a) What is the highest grade or year of ELEMENTARY OR SECONDARY (HIGH) SCHOOL you have taken. (Persons educated outside Canada should report the equivalent level of schooling according to the education system of B.C.) _____

(b) In which province or country was this highest grade completed? _____ (Province, or other Country)

5. Please list in the table below any of the following types of education or training that you have taken.

a) an OCCUPATIONAL OR CAREER-ORIENTED COURSE of three months or longer. (e.g. apprenticeship training, vocational courses, career-oriented courses at community colleges or institutes of technology. Do not include high school courses).
b) a UNIVERSITY EDUCATION of one year or more.

If you have taken none of the above, check this box [1] and go to question 6.

Subject of Course or Major Field of Study (If apprenticeship training please specify e.g. Millwright Apprentice)	Name and Location of Educational Institution (Where Applicable)	Start Date (Month & Year)	End Date (Month & Year)	Licence, Certificate, Diploma or Degree Obtained (if any)
1.		. .	. .	
2.		. .	. .	
3.		. .	. .	
4.		. .	. .	

6. Please complete the following table by describing your current job and your most recent previous job that lasted 3 months or more. In the case of the previous job, if you had a different occupation with the same employer specify below. If not, specify your previous job with a different employer.

	CURRENT JOB	PREVIOUS JOB (If you have not worked before, check box ☐ and go to question 7)
a) Job Title/Kind of work (e.g. drift driller, mining engineer, heavy duty mechanic)		
b) Most important activities or duties in this work. (e.g. operating percussion drill, designing mining facilities, maintenance of heavy equipment)		
c) Employer (Name of company or government agency)	FOR OFFICE USE	
d) Kind of industry, business or service (e.g. copper mine, sandstone quarry, logging)		
e) Location of work (nearest town if in B.C., province, or country)		
f) When did you commence this job? (Month and year)		
	For Office Use	For Office Use

7. If you have taken apprenticeship training, please describe below the major sponsor of your training.

a) Employer (Name of Company) _____
b) Location of work (nearest town) _____
c) Kind of Industry _____

Office Use

Thank you for your cooperation. Please mail the completed questionnaire in the pre-paid envelope provided.

APPENDIX C.1

MIGRANTS TO B.C. WHO WERE QUALIFIED IN THEIR CURRENT OCCUPATION PRIOR TO ARRIVAL, BY AGE WHEN MIGRATED TO B.C.
Professional and Technical

Occupation	Total Qualified Migrants	Age Upon Arrival in B.C. (%)			
		18-24	25-34	35-54	55+
Total Professional & Technical	838	27.9	55.0	16.5	0.6
Total Professional	559	21.3	59.9	18.6	0.2
Total Engineers	258	20.5	58.5	20.9	-
Metallurgical Engineers	39	31.6	50.0	18.4	-
Mining Engineers	126	23.0	58.7	18.3	-
Other Engineers	93	13.3	61.4	25.3	-
Total Scientists	220	26.4	56.8	16.8	-
Geologists	199	27.0	57.8	15.1	-
Other Scientists	21	17.6	47.1	35.3	-
Systems Analysts	29	20.0	76.0	4.0	-
Accountants	48	4.6	71.1	22.2	2.2
Other Professional	4	-	75.0	25.0	-
Total Technicians	279	41.2	45.2	12.2	1.4
Total Eng. & Sc. Technicians	262	42.0	46.2	11.1	0.8
Draughtsmen	49	51.2	39.0	9.8	-
Surveyors	38	40.0	53.3	6.6	-
Assayers	44	16.7	61.9	16.7	4.8
Other Eng. & Sc. Technicians	131	47.0	42.0	11.0	-
Non Eng. & Sc. Technicians	17	30.0	30.0	30.0	10.0

APPENDIX C.2

PLACE OF RESIDENCE IMMEDIATELY PRIOR TO CURRENT JOB
Professionals By Sub Industry

Sub Industry	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	899	58.3	36.2	5.5
Metal Mines	465	61.6	31.9	6.5
Coal Mines	147	39.7	56.0	4.3
Non Metal Mines	27	52.0	44.0	4.0
Sand Pits & Quarries	3	66.7	33.3	-
Services	257	62.0	31.4	6.6

Professionals By Region

Region	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	899	58.3	36.2	5.5
North	133	48.1	48.8	3.1
Interior	129	69.3	23.7	7.0
Southeast	157	39.9	54.0	6.1
Lower Mainland	447	64.7	28.4	6.9
Vancouver Island	*	*	*	*

Technicians By Sub Industry

Sub Industry	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	662	68.7	28.4	2.9
Metal Mines	392	72.6	23.6	3.8
Coal Mines	133	59.5	38.9	1.6
Non Metal Mines	29	72.4	24.1	3.5
Sand Pits & Quarries	3	100.0	-	-
Services	105	63.9	33.3	2.8

Technicians By Region

Region	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	662	68.7	28.4	2.9
North	130	67.2	27.9	4.9
Interior	148	75.4	22.4	2.2
Southeast	202	63.7	34.5	1.8
Lower Mainland	147	65.2	32.2	2.6
Vancouver Island	*	*	*	*

*Estimates unreliable

APPENDIX C.3

AGE WHEN COMPLETED POST SECONDARY EDUCATION BY OCCUPATION
Professional and Technical

Occupation	Total With Post Sec. Education	Age When Completed Education (%)						
		Under 18	18-19	20-21	22-23	24-25	26-30	Over 30
Total Professional & Technical	1,385	.8	2.3	14.3	31.1	19.8	22.6	9.2
Total Professional	875	.5	.3	5.8	32.9	23.4	26.3	10.7
Total Engineers	335	.3	-	3.1	40.6	24.2	23.9	7.9
Metallurgical Engineers	59	-	-	7.1	35.7	16.1	26.8	14.3
Mining Engineers	152	-	-	2.7	46.7	20.7	23.3	6.7
Other Engineers	124	.9	-	1.8	34.8	33.0	23.2	6.3
Total Scientists	349	-	-	4.1	36.9	25.1	27.1	6.8
Geologists	299	-	-	3.7	37.5	26.0	26.0	6.8
Other Scientists	50	-	-	7.0	32.6	18.6	34.9	7.0
Systems Analysts	42	-	-	32.4	38.2	11.8	17.6	-
Accountants[1]	130	2.0	2.0	7.9	2.0	22.8	30.7	32.7
Other Professional	19	-	-	16.7	27.8	5.6	44.4	5.6
Total Technicians	510	1.4	5.7	28.9	27.9	13.5	16.3	6.5
Total Eng. & Sc. Technicians	482	1.5	6.0	30.4	25.6	13.5	16.4	6.6
Draftsmen	73	4.5	7.6	34.8	31.8	12.1	7.8	1.5
Surveyors	75	-	11.6	29.0	24.6	15.9	8.7	10.1
Assayers	92	-	2.3	29.9	26.4	16.1	17.2	8.0
Other Eng. & Sc. Technicians	242	1.5	5.1	29.8	24.2	12.1	20.7	6.6
Non Eng. & Sc. Technicians	28	-	-	-	68.2	13.6	13.6	4.5

1 The large proportion of Accountants who are over the age of 30 years reflects the training structure of this profession which combines on the job training with institutional education.

APPENDIX C.4

LOCATION OF MOST RELEVANT POST SECONDARY EDUCATION BY OCCUPATION
Professional & Technical

Occupation	Total With Post-Sec. Education	Location (%)					
		B.C.	Other Canada	U.S.A.	U.K.	Other Europe	Other World
Total Professional & Technical	1,385	44.4	39.9	4.3	3.3	2.0	6.1
Total Professional	875	41.7	39.7	5.3	4.5	2.9	6.0
Total Engineers	335	24.5	48.9	7.2	6.3	4.5	8.7
Metallurgical Engineers	59	33.9	40.7	3.4	6.8	10.2	5.1
Mining Engineers	152	20.4	47.4	8.6	7.9	3.3	12.5
Other Engineers	124	25.0	54.8	7.3	4.0	3.2	5.6
Total Scientists	349	44.4	40.4	4.6	3.1	2.3	5.2
Geologists	299	41.1	44.8	4.7	3.3	1.7	4.4
Other Scientists	50	64.0	14.0	4.0	2.0	6.0	10.0
Systems Analysts	42	46.3	43.9	9.8	-	-	-
Accountants	130	72.4	15.8	1.6	5.5	1.6	3.1
Other Professional	19	78.9	15.8	-	-	-	5.3
Total Technicians	510	49.1	40.1	2.8	1.2	.6	6.3
Total Eng. & Sc. Technicians	482	49.2	40.3	2.5	1.2	0.6	6.2
Draftsmen	73	33.3	50.0	-	2.8	-	13.9
Surveyors	75	56.0	36.0	8.0	-	-	-
Assayers	92	55.4	25.0	2.2	-	1.1	16.3
Other Eng. & Sc. Technicians	242	49.4	44.4	1.7	1.7	0.8	2.1
Non Eng. & Sc. Technicians	28	48.2	37.0	7.4	-	-	7.4

APPENDIX C.5

PROMOTION INTO MANAGEMENT
BY PREVIOUS OCCUPATION AND
AGE WHEN MOVED INTO MANAGEMENT
Professional and Technical

Previous Occupation	Age Distribution (%)				
	Under 25	25 - 34	35 - 44	45 - 54	55 & over
Total Prof. & Tech.	2.2	47.0	33.6	14.2	3.0
Total Professional	-	52.4	30.5	15.2	1.9
Total Engineers	-	58.1	25.8	12.9	3.2
Metallurgical Engineers	-	-	-	-	-
Mining Engineers	-	50.0	27.8	16.7	5.5
Other Engineers	-	69.2	23.1	7.7	-
Total Scientists	-	52.1	25.0	20.8	2.1
Geologists	-	43.4	33.3	20.0	3.3
Other Scientists	-	66.7	13.3	20.0	-
Systems Analyses	-	-	50.0	50.0	-
Accountants	-	53.3	40.0	6.7	-
Other Prof.	-	-	100.0	-	-
Total Eng. & Sc. Tech.	9.1	27.3	45.4	9.1	9.1
Draftsmen	-	-	100.0	-	-
Surveyors	-	100.0	-	-	-
Assayers	-	33.3	50.0	-	16.7
Other Eng. & Sc. Tech.	14.3	21.4	42.9	14.3	7.1

APPENDIX C.6

AVERAGE DURATION OF EMPLOYMENT
WITH CURRENT EMPLOYER

Professionals
By Sub Industry

Sub-Industry	Average Number of Years
Total	3.72
Metal Mines	3.83
Coal Mines	3.10
Non-Metal Mines	2.80
Quarries & Sand Pits	*
Services	4.24

Professionals
By Region

Region	Average Number of Years
Total	3.72
North	2.88
Interior	3.82
Southeast	3.53
Lower Mainland	3.81
Vancouver Island	*

Technicians
By Sub Industry

Sub-Industry	Average Number of Years
Total	4.20
Metal Mines	4.72
Coal Mines	3.60
Non-Metal Mines	2.75
Quarries & Sand Pits	*
Services	4.30

Technicians
By Region

Region	Average Number of Years
Total	4.20
North	3.17
Interior	5.91
Southeast	3.74
Lower Mainland	3.70
Vancouver Island	*

* Estimate Unreliable

APPENDIX D.1

MIGRANTS TO B.C. WHO WERE QUALIFIED IN THEIR CURRENT OCCUPATION PRIOR TO ARRIVAL, BY AGE WHEN MIGRATED TO B.C.
Tradesmen

Occupation	Total Qualified Migrants	Age Upon Arrival in B.C. (%)			
		18-24	25-34	35-54	55+
All Tradesmen	1461	12.5	53.4	32.9	1.3
All Journeymen	1365	11.8	52.9	34.0	1.4
Millwrights	215	12.5	44.4	41.7	1.4
Heavy Duty Mechanics	355	5.7	58.7	35.6	-
Electricians	261	4.7	60.6	32.3	2.4
Welders	227	22.5	48.2	27.0	2.3
Other Journeymen	307	15.9	49.4	33.0	1.7
Journeyman's Assistants	96	22.1	60.3	17.6	-

APPENDIX D.2

PLACE OF RESIDENCE IMMEDIATELY PRIOR TO JOB WITH CURRENT EMPLOYER
Tradesmen

By Sub Industry

Sub Industry	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	3321	63.1	32.2	4.7
Metal Mines	2249	66.7	29.0	4.3
Coal Mines	867	49.2	44.0	6.8
Non-Metal Mines	131	64.5	29.0	6.5
Sand Pits & Quarries	41	90.6	9.4	-
Services	33	100.0	-	-

By Region

Region	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	3321	63.1	32.2	4.7
North	703	67.9	26.1	6.0
Interior	1078	65.7	30.6	3.7
Southeast	1159	52.4	41.3	6.3
Lower Mainland	75	82.8	17.2	-
Vancouver Island	306	*	*	*

By Size of Establishment

Size of Establishment	Total	Place of Residence (%)		
		B.C.	Other Canada	Other World
Total	3321	63.1	32.2	4.7
1000 +	1393	50.5	43.8	5.7
500 - 999	652	64.0	31.4	4.6
200 - 499	987	71.3	23.8	4.9
100 - 199	102	83.1	14.5	2.4
50 - 99	90	87.1	11.4	1.4
20 - 49	61	89.1	8.7	2.2
Less than 20	36	85.7	14.3	-

* Estimate Unreliable

APPENDIX D.3

LOCATION OF MOST RELEVANT POST-SECONDARY EDUCATION
Tradesmen

Occupation	Total with Post-Sec. Education	Location (%)					
		B.C.	Other Can.	U.S.A.	U.K.	Other Europe	Other World
Total Tradesmen	2769	52.1	34.0	.5	4.1	4.6	4.7
Total Journeymen	2581	52.5	33.4	0.6	4.3	4.6	4.6
Millwright	475	58.5	28.3	1.1	5.1	3.2	3.8
Heavy Duty Mechanics	698	54.8	31.4	0.6	5.1	3.5	4.6
Electricians	421	41.0	40.9	1.2	8.3	1.7	6.9
Welders	416	53.5	36.6	0.7	1.9	4.6	2.7
Other Journeymen	571	52.8	32.0	-	1.2	9.2	4.8
Journeymen's Assistants	188	46.8	42.1	-	1.7	3.5	5.9

APPENDIX D.4

PERCENT OF JOURNEYMEN WITH TICKETS

By Sub Industry

Sub Industries	Total Journeymen	Percent With Tickets
All Sub Industries	2994	62.2
Metal Mines	1958	63.1
Coal Mines	835	79.6
Non-metal Mines	127	67.5
Quarries and Sand Pits	41	40.0
Services	33	29.4

By Region

Regions	Total Journeymen	Percent With Tickets
British Columbia	2994	62.2
North	621	63.4
Interior	900	62.5
Southeast	1123	77.4
Lower Mainland	75	42.9
Vancouver Island	275	*

By Size Group

Size of Establishment	Total Journeymen	Percent with Tickets
All Size Groups	2994	62.2
1000+	1306	75.4
500 - 999	540	63.3
200 - 499	869	62.7
100 - 199	101	59.4
50 - 99	89	58.1
20 - 49	53	40.9
Less than 20	36	39.1

* Estimate Unreliable

APPENDIX D.5

THE PROPORTION OF JOURNEYMEN WHO ARE CURRENTLY EMPLOYED BY THEIR SPONSORING EMPLOYER

By Sub-Industry

Sub Industry	% With Same Employer
All Journeymen	17.7
Metal Mines	13.6
Coal Mines	24.7
Non-Metal Mines	29.5
Sand Pits or Quarries	-
Services	-

By Region

Region	% With Same Employer
All Journeymen	17.7
North	22.5
Interior	16.3
Southeast	20.0
Lower Mainland	-
Vancouver Island	*

By Size of Establishment

Size of Establishment	% With Same Employer
All Journeymen	17.7
1000+	19.0
500 - 999	22.1
200 - 499	14.2
100 - 199	8.6
50 - 99	25.8
20 - 49	-
Less than 20	-

* Estimate unreliable

APPENDIX D.6

PROMOTION INTO MANAGEMENT BY PREVIOUS OCCUPATION
AND AGE WHEN MOVED INTO MANAGEMENT
Journeymen

Previous Occupation	Age Distribution (%)				
	Under 25	25 - 34	35 - 44	45 - 54	55 + over
Millwrights	-	40.0	44.0	8.0	8.0
Heavy Duty Mech.	4.5	56.1	28.8	3.0	7.6
Electricians	-	71.4	21.4	7.1	-
Welders	-	-	-	-	-
Other Journeymen	6.1	38.8	40.8	14.3	-

APPENDIX D.7

AVERAGE DURATION OF EMPLOYMENT
WITH CURRENT ESTABLISHMENT
Tradesmen

By Sub Industry

Sub Industry	Average No. of Years
Total	4.6
Metal Mines	4.2
Coal Mines	5.3
Non-Metal Mines	3.4
Quarries & Sand Pits	7.4
Services	3.3

By Region

Region	Average No. of Years
Total	4.6
North	4.1
Interior	4.1
Southeast	5.3
Lower Mainland	3.9
Vancouver Island	*

By Size of Establishment

Size of Establishment	Average No. of Years
Total	4.6
1000 +	4.8
500 - 999	3.9
200 - 499	4.5
100 - 199	*
50 - 99	6.8
20 - 49	5.6
Less than 20	5.0

* Estimate Unreliable